QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Arrest of Development in the Sternum.

At a late meeting of the Brooklyn Anatomical and Surgical Club (*Proceedings of Med. Society of the County of Kings*, Jan. 1879), Dr. CHARLES JEWETT presented the sternum removed from the body of the late Dr. E. A. Groux, who died October 15, 1878, aged 45 years, with an account of his case, which during life had been an object of medical interest throughout the world.

The sternum was an example of complete median fissure of the bone with no other failure of development. At the autopsy an incision was made through the skin and superficial fascia which opened directly into the anterior mediastinum. No other structure bridged the space between the lateral halves of the bone. The heart was found normal in size and shape, and normally situated, except that the position was slightly higher than usual, the apex presenting at the level of the upper border of the fifth rib. The right auricle lay wholly to the right of the median line. The position of the right ventricle corresponded precisely with that of the pulsating tumour observed by the committee of the New York Pathological Society (*Amer. Med. Monthly*, Jan. 1859), just beneath the integument in the medio-sternal space and extending from the second to the fourth intercostal space and from the median line to the left edge of the fissure.

In looking at the sternum it is observed that were the lateral halves united a slight deficiency in width would be seen at the upper portion of the manubrium, perhaps one-half inch. The lower segment of the gladiolus would also be found somewhat smaller than usual. Otherwise there is no deficiency of bony substance.

The articulations of the fifth, sixth, and seventh costal cartilages were found to deviate somewhat from their normal relations to the lower segment of the gladiolus. While the fissure divides the entire bone, the lateral portions of the lower segment of the gladiolus articulate with each other. Each articular surface is covered by a cartilage, and the two parts of the bone are bound together by external ligamentous bands. The articular cartilages of this joint blend below with the ensiform appendix.

The vertical depth of the fissure from the level of the sterno-clavicular articulation to the bottom of the cleft is four inches. Width at the level of the first costal cartilage, one inch. Width at widest part, 1.4 inch.

The specimens has been carefully prepared by Dr. Pilcher, for the Museum of the Anatomical and Surgical Club, to which it has been formally donated by the widow of Dr. Groux.

Dr. Groux is supposed to have possessed the power to arrest the action of the heart at will without producing any other disturbance of his usual condition. On taking two or three quick inspirations, by an effort the cardiac movements were apparently stopped for about twenty seconds, and he never deemed it prudent to prolong the effort beyond that time. The committee of the New York Pathological Society "were not able to see that he did anything else than to stop the pulse at the left wrist, the circulation continuing everywhere else," and they attributed this power to stop the pulse at the left wrist to the unusual mobility of the clavicle, by which the subclavian artery was compressed at the top of the chest.

Appended to the paper is a bibliography of the malformation.

The Eustachian Tube.

The action of the palatal muscles on the Eustachian tube is the subject of an interesting lecture delivered by Professor LUCAE, to the Physiological Society of Berlin, and published in a recent number of Virchow's *Archiv*. A short time ago, in the same journal, Lucae recorded some observations on an individual whose nasal cartilages had been destroyed by lupus, which observation went far to decide the much-disputed question of whether the Eustachian tube is permanently open or closed. They confirm the statement of many previous observers that the tube cannot be regarded as permanently open. It is rather loosely closed, and opens in different individuals with different degrees of readiness on the occurrence of variations in the pressure of air in the pharynx and tympanic cavity respectively. During the act of swallowing, the tube is, as Michel maintained, closed, and it is also closed during phonation. The observations seemed to show that the view that the tensor opens the tube during the act of swallowing is erroneous, although the muscle probably assists in opening the tube at the end of the act of deglutition, as soon as the action of the levator is over, and the soft palate again falls. During deglutition, phonation, aspiration, and forced breathing, the raised palate presses together the lips of the opening of the Eustachian tube, and thus air is forced towards the middle ear.

In his recent lecture Lucae has given the results of his investigation of two other cases in which the nasal cartilages were destroyed. The changes to be observed in the mouths of the Eustachian tubes during movements of the soft palate were exactly the same as those seen in the former case. When the palate was raised the lips of the tube were pressed together, and were separated when the palate fell. No movement could be perceived in the anterior lip, but the cartilaginous rim was each time moved from the anterior lip towards the posterior wall of the pharynx, whilst the floor of the tube was pushed into the triangular space thus formed. During this action, if there was a drop of fluid in the mouth of the tube, it was moved towards the middle line of the body, especially during the powerful elevation of the palate which occurs during the act of swallowing. The defect of the alæ nasi was in one case so great as to permit the introduction of a small laryngoscopic mirror, by which a direct view of the mouth of the tube was obtained; and it was seen that during rest and ordinary respiration there was only a small furrow, which, when the soft palate was raised in deglutition and phonation, became almost obliterated. On the ground of observations on the pressure on the middle ear during deglutition, Lucae thinks it highly probable that external closure of the tube is associated with an internal dilatation, either by simple mechanical inflation or simultaneous action of the tensor palati *seu* dilator tubæ, but no direct proof of